

Claims:

We claim,

1. A method of optimizing a shipment of at least one product from a plurality of shippers to at least one receiver, the plurality of shippers being different business entities, comprising the steps of:
 - (a) determining a maximum load of at least one transport vehicle from the plurality of shippers; and
 - (b) optimizing the maximum load of at least one transport vehicle.
- 10 2. The method of claim 1, wherein the determining step including the step of determining at least one of a maximum mass, maximum length, maximum height, maximum width, maximum volume, and pallet footprint of the at least one transport vehicle.
3. The method of claim 1, wherein the determining step further includes the step of establishing at least one optimization metric.
4. The method of claim 3, wherein the metric establishing step further includes the step of establishing at least one of the following metrics: a capacity utilization per vehicle mile, total transportation cost metric; transportation cost as percentage of product value shipped metric; shipping revenue metric; total logistics cost metric; and shipping revenue less freight cost metric.
5. The method of claim 4, wherein the optimization step further includes the step of exercising 20 discretionary control over the products to be shipped.
6. The method of claim 5, wherein the exercising step further includes the step of prioritizing the products to be shipped.
7. The method of claim 6, wherein the optimization step further includes the step of optimizing the product shipment temporally among at least one other shipment.

8. The method of claim 6, wherein the maximum load optimization step further includes the step of providing a trade allowance to the at least one receiver.

9. The method of claim 8, wherein the trade allowance is a rebate.

10. The method of claim 6, wherein the prioritization step further includes the step of

5 determining at least one of the following steps:

(a) calculating a mix of additional products to be added to at least part of the shipment when a total amount of product shipped is greater than a minimum amount of product initially ordered;

(b) calculating a mix of additional product to be added to at least part of the shipment when the maximum vehicle load or a combined maximum load of a plurality of vehicles is not exceeded;

(c) scheduling the shipment from the plurality of shippers to arrive at a cross-dock before shipping the product to the at least one receiver; and

(d) optimizing the optimization metric.

11. The method of claim 6, wherein the method further includes the step of manipulating the shipment at a cross-dock.

12. The method of claim 11, wherein the step of manipulating the shipment at a cross-dock includes the step of classifying the stock with destination indicia.

13. The method of claim 12, wherein the classifying step further includes the step of applying at

20 least one of a label, SKU code, pallet tag, and UPC code.

14. The method of claim 11, wherein the method further includes the step of ensuring that products entering the cross-dock have a predefined destination beyond the cross-dock.

15. The method of claim 6, wherein the method further includes utilizing a vehicle tracking system.

16. A method of optimizing a shipment of at least one product from a plurality of shippers to a plurality of receivers, the plurality of shippers being different business entities, comprising the steps of:

5 (a) determining a maximum load of at least one transport vehicle from the plurality of shippers; and

(b) optimizing the maximum load of the least one transport vehicle.

17. The method of claim 16, wherein the determining step including the step of determining at least one of a maximum mass, maximum volume, maximum length, maximum height, maximum width, and pallet footprint of the at least one transport vehicle.

18. The method of claim 16, wherein the determining step further includes the step of establishing at least one optimization metric.

19. The method of claim 18, wherein the metric establishing step further includes the step of establishing at least one of the following metrics: a capacity utilization per vehicle mile, total transportation cost metric; transportation cost as percentage of product value shipped metric; shipping revenue metric; total logistics cost metric; and shipping revenue less freight cost metric.

20. The method of claim 19, wherein the optimization step further includes the step of exercising discretionary control over the at least one product to be shipped.

21. The method of claim 20, wherein the exercising step further includes the step of prioritizing the products to be shipped.

22. The method of claim 21, wherein the optimization step further includes the step of optimizing the product shipment temporally among at least one other shipment.

23. The method of claim 21, wherein the maximum load optimization step further includes the step of providing a trade allowance to the at least one receiver.

24. The method of claim 23, wherein the trade allowance is a rebate.

25. The method of claim 21, wherein the prioritization step further includes the step of determining at least one of the following steps:

- (a) calculating a mix of additional products to be added to at least part of the shipment

5 when a total amount of product shipped is greater than a minimum amount of product initially ordered;

- (b) calculating a mix of additional product to be added to at least part of the shipment when the maximum vehicle load is not exceeded;
- (c) scheduling the shipment from the plurality of shippers to arrive at a cross-dock before

10 shipping the product to the at least one receiver; and

- (d) optimizing the optimization metric.

26. The method of claim 21, wherein the method further includes the step of manipulating the shipment at a cross-dock to ensure that products entering the cross-dock have a predefined destination beyond the cross-dock.

15 27. The method of claim 26, wherein the step of manipulating the shipment at a cross-dock includes the step of classifying the stock with destination indicia.

28. The method of claim 27, wherein the classifying step further includes the step of applying at least one of a label, SKU code, pallet tag, vehicle tracking system, and UPC code.

29. A system to optimize an optimization metric of products transported from a plurality of

20 shippers to at least one receiver, comprising:

- (a) a central facility adapted to receive and process information
- (b) an inventory indicator adapted to transmit inventory information from the plurality of receivers to the central facility;

(c) a cross-dock station adapted to process shipments from the plurality of shippers and adapted to transport shipments of products to the plurality of receivers;

(d) a means for optimizing the optimization metric by correlating the inventory information of the shipments at the central facility to the plurality of receivers.

5 30. A computer program embodied on a tangible medium to optimize shipment of merchandise on a vehicle by filling or substantially filling the vehicle, comprising:

- (a) a first set of instructions to determine a vehicle load capacity;
- (b) a second set of instructions to determine a shipment requirement
- (c) a third set of instructions to generate a comparison by comparing the vehicle load capacity with the shipment requirement;
- (d) a fourth set of instructions to optimize an optimization metric to load more merchandise on the vehicle if the comparison indicates that the vehicle is not yet full or substantially full.

10 31. A signal-bearing medium having encoded machine-readable instructions, comprising:

- a first set of machine-readable instructions for calculating a transport vehicle maximum load capacity of a first transport vehicle;
- a second set of machine-readable instructions for calculating a first order load;
- a third set of machine-readable instructions for comparing the first order load with the transport vehicle maximum load capacity;
- 15 a fourth set of machine-readable instructions for determining a destination for the first transport vehicle;
- a fifth set of machine-readable instructions for correlating the destination of the other cross-dock load; and

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a sixth set of machine-readable instructions for correlating the destination of the other cross-dock load.

32. A signal-bearing medium having encoded machine-readable instructions, comprising:

5 a first set of machine-readable instructions for calculating an optimization metric of a first vehicle that is destined to at least one receiver;

10 a second set of machine readable instructions for calculating a product requirement of the at least one receiver; and

15 a third set of machine readable instructions for generating a shipment list of the products requirement that is to be shipped to the at least one receiver.

33. A server apparatus comprising:

20 a communication port that receives a periodic inventory message from a entity;

25 a memory having a database with at least one inventory table and an optimization metric table;

30 a controller operably connected to the communication port and the memory by an electrical signal path, the controller processes the periodic inventory message and identifies a subset of inventory from the at least one inventory table that results in an optimal shipment order relative to the optimization metric from the optimization metric table.

34. The server apparatus of claim 33, further comprising:

35 a printer port operably coupled to the controller that transmits the optimal shipment order to a output device.

40 35. The server apparatus of claim 33, wherein the communication port transmits the optimal shipment order for receipt by a shipper.

36. The server apparatus of claim 35, further comprising an acknowledgement from the shipper being processed by the controller enabled by receipt of the acknowledgement at the communication port.

37. The server apparatus of claim 35, further comprising another acknowledgement being sent to the entity in response to the receipt of the acknowledgement being processed by the controller.

38. The server apparatus of claim 33, further comprising a RF communication port that receives GPS data from a vehicle.

39. A method of optimizing a truck load capacity of products transported from at least one shipper to at least one receiver, comprising the steps of:

- (a) ordering a first shipper product from the at least one shipper;
- (b) determining a first destination receiver for the first shipper product;
- (c) ordering a second shipper product from another of the at least one shipper;
- (d) determining a second destination receiver for the second shipper product;
- (e) comparing the first destination receiver to the second destination receiver;
- (f) organizing the first shipper product and the second shipper product in the same truck if the first destination receiver is the same as the second destination receiver; and
- (g) repeating the above steps until the truck is substantially filled to capacity.

40. A method of replenishing products of at least one distributor by shipments from at least one manufacturer, comprising the steps of:

- (a) calculating a transport vehicle maximum load of a first vehicle destined to the least one distributor;
- (b) calculating a product requirement of the at least one distributor

(c) adding products, at a cross-dock, to the shipment until the maximum load capacity is substantially achieved; and

(d) transporting the shipment from the at least one manufacturer to the at least one distributor.

5 41. The method of claim 40, wherein an optimization algorithm optimizes the products at a cross-dock.

42. The method of claim 40, wherein an optimization algorithm optimizes the flow of product across time to maximize the transport vehicle maximum load.